

CLAIMS

We claim:

1. A sulfur vulcanizable rubber composition which does not contain aromatic process oils, comprising:

at least one diene elastomer;

at least finely dispersed, precipitated silica and carbon black as fillers, said finely dispersed, precipitated silica and said carbon black being present in a weight ratio of silica to carbon black of 1:2 to 20:1;

softeners including 5 to 60 phr of at least one mineral oil softener, comprising a content of polycyclic aromatic compositions of less than 3 wt-% in reference to the total weight of the at least one mineral oil softener, determined by DMSO extract according to IP 346 method, and a glass transition temperature less than -45°C, and 1-20 phr of at least one of at least one glyceride and at least one factice; and

at least one silane coupling agent.

2. The rubber composition according to claim 1 wherein the at least one glyceride comprises rapeseed oil.

3. The rubber composition according to claim 1 wherein the at least one diene elastomer is selected from at least one of natural rubber, synthetic polyisoprene, polybutadiene, and styrene-butadiene-copolymers.

4. The rubber composition according to claim 2 wherein the at least one diene elastomer is selected from at least one of natural rubber, synthetic polyisoprene, polybutadiene, and styrene-butadiene-copolymers.

5. The rubber composition according to claim 1 wherein the weight ratio of finely dispersed, precipitated silica to carbon black is 1:1 to 20:1.

6. The rubber composition according to claim 2 wherein the weight ratio of finely dispersed, precipitated silica to carbon black is 1:1 to 20:1.

7. The rubber composition according to claim 3 wherein the weight ratio of finely dispersed, precipitated silica to carbon black is 1:1 to 20:1.

T042220-G69360660

8. The rubber composition according to claim 1 wherein the finely dispersed silica has a nitrogen surface of 35 to 350 m<sup>2</sup>/g and a pore volume of 0.2 to 3.4 mL/g.

9. The rubber composition according to claim 7 wherein the finely dispersed silica has a nitrogen surface of 35 to 350 m<sup>2</sup>/g and a pore volume of 0.2 to 3.4 mL/g.

10. The rubber composition according to claim 1 wherein the at least one silane coupling agent is present in an amount of 0.2 to 30 parts per weight in relation to 100 parts per weight of silica.

11. The rubber composition according to claim 2 wherein the at least one silane coupling agent is present in an amount of 0.2 to 30 parts per weight in relation to 100 parts per weight of silica.

12. The rubber composition according to claim 3 wherein the at least one silane coupling agent is present in an amount of 0.2 to 30 parts per weight in relation to 100 parts per weight of silica.

13. The rubber composition according to claim 1 comprising 10 to 80 phr silica and 1 to 60 phr carbon black.

14. The rubber composition according to claim 2 comprising 10 to 80 phr silica and 1 to 60 phr carbon black.

15. The rubber composition according to claim 3 comprising 10 to 80 phr silica and 1 to 60 phr carbon black.

16. A process for producing a sulfur vulcanizable rubber composition which does not contain aromatic process oils, the rubber composition comprising:

at least one diene elastomer;

at least finely dispersed, precipitated silica and carbon black as fillers, the finely dispersed, precipitated silica and the carbon black being present in a weight ratio of silica to carbon black of 1:2 to 20:1;

softeners including 5 to 60 phr of at least one mineral oil softener, comprising a content of polycyclic aromatic compositions of less than 3 wt-% in reference to the total weight of the at least one mineral oil softener, determined by DMSO extract according to IP

346 method, and a glass transition temperature less than -45°C, and 1-20 phr of at least one of at least one glyceride and at least one factice; and

at least one silane coupling agent;

the process comprising:

(a) mixing the at least one diene elastomer, the finely dispersed, precipitated silica, the carbon black, the at least one mineral oil softener, and the at least one of at least one glyceride and at least one factice, and the at least one silane coupling agent, in the absence of a vulcanization system, and, simultaneously, heating the composition to a temperature of up to 180°C; and

(b) adding and mixing a vulcanization system at a temperature below the vulcanization temperature.

17. The process according to claim 16 wherein the mixing of (a) includes at least one heating and cooling cycle.

18. A rubber product composed of the rubber composition of claim 1 vulcanized with sulfur.

19. The rubber product according to claim 1 comprising a tread strip of a tire.

20. A tire including a tread strip, said tire at least partially composed of a rubber composition of claim 1 vulcanized with sulfur.

21. The tire according to claim 20 wherein said tread strip is at least partially composed of the rubber composition.